

## REMARKS

### Drawings

Fig. 24 is corrected to include reference designators Q2 and Q6 as described in the specification at page 23, lines 1-2. A replacement drawing sheet is included as an attachment.

### Specification

The specification is objected to for lack of antecedent basis for the claim "back-bias" in claims 14, 16, 18, 20, 23 and 27. Applicant traverses this objection. Antecedent basis can be found in the specification, e.g., at page 23, line 4.

### Claims Rejections Under 35 U.S.C. §112

Claims 28-31 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Applicant traverses this rejection.

Claim 28, which reads, for example, on the embodiment of Fig. 24, is amended for clarity. The resistor of claim 28 reads, e.g., on  $R_C$  in the embodiment of Fig. 24, while the second resistor of claim 29 reads, e.g., on  $R_S$  in the embodiment of Fig. 24.

Claims 30 and 31 read, for example, on the embodiment of Fig. 24.

Claims 14, 16, 18, 20, 23 and 27 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner alleges that the meaning of the term "back-bias component" is unclear. Applicant traverses this rejection. The concept of back-biasing the arrangement is explained at page 23, lines 1-7 of the specification.

### Claims Rejections Under 35 U.S.C. §102

Claims 12-16 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,909,136 issued to Kimura. Applicant traverses this rejection.

Claim 12 recites first and second sub-exponential current generators. The term "sub-exponential" is understood to refer to a current generator in which the output current is *deliberately* softened so as to deviate from an ideal exponential function. See, for example, page 19, lines 12-16 of the specification. Kimura does not disclose any structure or method

for deliberately changing the exponential function of an exponential current generator. The Examiner notes that Kimura relies on certain approximations and assumptions to characterize the current generators as exponential. Specifically, the Examiner notes Kimura's assumption at col. 8, line 6 that the alpha ( $\alpha_F$ ) of the transistors is equal to 1, when for a practical transistor, alpha is more likely to be 0.98-0.99. Essentially, the Examiner appears to be arguing that any deviation at all from a mathematically perfect exponential function transforms an exponential generator into a sub-exponential generator. This characterization, however, is overly broad and inconsistent with the meaning of the term "sub-exponential" as understood from the specification. Page 19, lines 12-16 of the specification list some examples of techniques for deliberately altering the ideal exponential function of a current generator: changing the transistor type or geometry, including degeneration resistors, or changing the bias current so as to purposely deviate from an ideal exponential function. Kimura discloses no such techniques. Kimura only discloses circuitry that is arranged and intended to operate as true exponential current generators, notwithstanding some inherent characteristics that may cause the actual operation to deviate slightly from an ideal exponential function. Therefore Kimura does not disclose sub-exponential current generators as recited in claim 12.

Regarding claims 14, 16 and 20, the rejection appears to be moot in view of the explanation of "back-bias" as discussed above.

Regarding claim 15, Applicant disagrees with the characterization of the claim as being merely a method to operate the apparatus of claim 12. Nonetheless, the same arguments relating to the meaning of "sub-exponential" apply.

Claim 19 is amended to recite altering the first and second currents so as to provide sub-exponential functions. As discussed above with respect to claim 12, this involves deliberately softening the output so as to deviate from an ideal exponential function, and therefore, Kimura does not anticipate this claim.

#### Claims Rejections Under 35 U.S.C. §103

Claims 17-18 and 21-27 are rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,909,136 issued to Kimura. Applicant traverses this rejection.

Claim 17 recites scaling the first and second currents responsive to a control signal *while generating and combining the first and second currents*. In other words, the first and second currents are scaled while the circuit is operating. Kimura neither discloses nor

suggests scaling the currents during operation. The examiner argues that it would have been obvious to scale the currents during operation to save the time needed to power down the system, but even this argument seems to contemplate having the circuit operate at a fixed, albeit different, current level. This is an impermissible hindsight reconstruction, and therefore, a *prima facie* case of obviousness has not been established. But perhaps more importantly, this argument completely misses one of the main points of scaling the currents during circuit operation: it provides an additional signal input that allows the circuit to operate as both a squaring cell and a multiplier (i.e., implement a weighting function) at the same time. See, for example, page 20, lines 25-28 of the specification. Thus, claim 17 is neither anticipated by, nor rendered obvious in view of, Kimura.

Regarding claims 18, 23, and 27, the rejection appears to be moot in view of the explanation of “back-bias” as discussed above.

Claim 21 recites sub-exponential current generators. As discussed above, Kimura neither discloses nor suggests sub-exponential current generators. Thus, there is no basis for an anticipation or obviousness rejection of claim 21.

Regarding claim 23, Applicant disagrees with the inherent characterization of the method as being limited to the apparatus of claim 21. Nonetheless, the same arguments relating to the meaning of “sub-exponential” apply.

Regarding claim 26, the same arguments relating to claim 17 apply.

#### Obviousness-Type Double Patenting

Claims 12-13, 15, 21-22 and 24 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7, 15, 27 and 35, respectively, of co-pending Application No. 10/192,115. Applicant traverses this provisional rejection.

A terminal disclaimer is included with this communication. Therefore, this rejection, if continued, is rendered unnecessary without acquiescing in the propriety of the rejection.

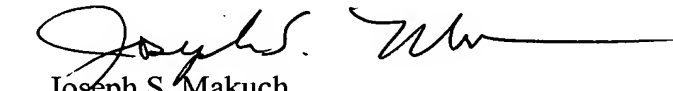
Conclusion

Applicant requests reconsideration in view of the foregoing amendments and remarks. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

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Respectfully submitted,

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